

If he is puzzled by the production of sodium salts from potassium thiosulphate, and turns to the fuller account on p. 85 for elucidation, he is confronted by the equation



In the subsequent directions, moreover, no attempt is made to shorten calculation by the use of a normal standard solution or of one that will enable the percentage of copper to be read off from the burette. The student is told to "Dissolve [0.5 grm. copper] in 5 c.c. nitric acid and boil till all nitrous fumes are expelled," a dangerous piece of advice, and one that contains no hint of the practice now often preferred of getting rid of the nitric acid by means of sulphuric acid and so removing all chance of the disconcerting return of the blue colour. The dangers of terseness are also shown in the account of the estimation of lead as lead sulphate, on p. 64, where the directions are as follows:—

"The solution is evaporated with sulphuric acid till the fumes of the acid are given off. The solution is diluted with water, allowed to settle, filtered, washed by decantation with water acidulated with sulphuric acid, and finally on the filter with dilute alcohol or water," and so forth.

These directions are inadequate, and it may be doubted whether either Prof. Rhead's or Prof. Sexton's students have ever been set to work without a fuller and more careful account of the precautions to be observed.

Among other blemishes, the omission of all reference to Mulder's neutral point in the Gay-Lussac method of estimating silver may be mentioned, and the importance of check assays in this method is not sufficiently insisted on.

However, all these faults do not prevent the book from being useful both as a supplement to oral laboratory teaching and as a book of reference to experienced assayers. It is divided into three parts, part i. being devoted to a brief description of laboratory appliances and general processes, part ii. to the assay of the more important metals as well as chlorine and sulphur, and part iii. to a short account of certain analyses which have to be made in practice in metallurgical works. Of these, part iii. is perhaps less satisfactory than the others, but, although it is far from complete, there is much useful information in it, and speaking generally, analytical chemists and assayers will not regret the addition of the volume to their bookshelves. T. K. R.

OUR BOOK SHELF.

The Climates and Baths of Great Britain. Vol. ii. Pp. xvi + 628. (London: Macmillan and Co., Ltd., 1902.) Price 12s. 6d. net.

THIS volume completes the work undertaken by the committee of the Royal Medical and Chirurgical Society of London in 1889. The general arrangement of the subject-matter is on the same plan as in vol. i., and in order to maintain this uniformity the meteorology of the same series of years (namely, 1880-1890) has been investigated.

The volume deals with London and Middlesex, the east coast, the midland counties, Lancashire, the lake district, Northumberland, North and South Wales, Ireland—including its mineral springs; and the whole of the work has been placed in the hands of contributors

whose names are well known in the medical world. It should be added that seven excellent maps, showing areas, elevations, rainfalls and isothermals, are also incorporated.

The local information contained in this and in the former volume was mainly collected by means of circular letters sent to medical men practising at the various health resorts and bath-places, in which they were asked their opinion as to the prevalence of certain diseases; the influence of the climate upon patients sent there for the treatment of different diseases; the common causes of death and frequency of old age among residents; the system of drainage; the water supply; and the local climatological data. Where medicinal baths exist, inquiry was made as to what morbid conditions are treated with advantage by these baths, the ways in which the waters are employed, the diseased conditions contraindicating their use, and the time of the year advised for their application.

The chapter dealing with London and Middlesex is certainly one of the best. The writer, Dr. William Ewart, remarks that in London "everything is artificial," from the "made ground" upon which it is built to its water courses, some of which are turned away from their natural beds, and to the composition of its air, so much altered by smoke, London fogs and mists, that the meteorology of London is one *sui generis*. Dr. Ewart asks, why should life in London be, on the test of mortality, so much safer than in many other districts? This he considers to be partly explained by the relative dryness and warmth prevailing in the streets; and he concludes that, with all its faults, its climate is a protective one, with less exposure, greater warmth and less humidity than is the case in many other districts.

The work is undoubtedly a valuable one, and well repays the large amount of time and labour which must have been devoted to its compilation. It will be found alike serviceable for reference to medical practitioners and their patients, and also to medical officers of health and local sanitary authorities, who are so largely interested in the health of the communities under their charge. The only respect in which this useful work leaves something to be desired is that the information should be of a more definite character than that furnished with reference to the prevalence of disease in some of the localities dealt with.

Electric Wiring: a Primer for the Use of Wiremen and Students. By W. C. Clinton, B.Sc. Pp. viii + 179. (London: John Murray, 1902.) Price 1s. 6d.

ELECTRIC wiring is not a very suitable subject on which to write a primer. From the wireman's point of view it is a subject to be studied only by practical apprenticeship; from the engineer's it is a special branch of electrical work to be taken up at a time when primers are things of the past. Nor do we quite see the right of such a book to a place in Mr. Murray's "Home and School Library," which is intended (as an advertisement sets forth) for the general reader as well as for school use. The general reader does not want to know how to make joints, and the schoolboy would be far better employed learning the first principles of electricity instead of the elementary details of one of its practical applications. Apart from considerations such as these, it must be admitted that Mr. Clinton has done his work well and written an interesting little book. He deals with wiring for both electric light and electric bells, and as these between them involve the principles of electricity, magnetism and electrochemistry, he has said a few words about the theory of all three subjects, and has strengthened these by the addition of some worked examples of an elementary character. The theoretical parts are necessarily brief, the bulk of the book being devoted to descriptions of the practical

work which are clearly written and well illustrated. A little more space might have been given to the construction of bell indicators and to the maintenance and peculiarities of batteries, both of more importance to the wireman than the details of the manufacture of electric incandescent lamps. Also the distribution of lamps to give the best illumination, the use of globes and shades, and the ageing of incandescent lamps are all subjects on which wiremen would be wise to be informed, which are dealt with either inadequately or not at all. There is a question we should like to ask: Is Mr. Clinton correct in saying that the B.C. holder is known as the "bottom contact"? We had always thought that the letters stood for "bayonet cap," and certainly "bayonet holder" is much the more general phrase.

Finally, we may add that the book should be useful to the wireman entering for the City and Guilds examination in this subject; he will find it a valuable travelling companion as he proceeds to the examination room.

M. S.

The Common Spiders of the United States. By James H. Emerton. Pp. xviii + 225. (Boston, U.S.A., and London: Ginn and Company, 1902.) Price 6s. 6d. net.

THE study of spiders is probably less neglected in the United States than in Britain, for writers on general entomology like Packard and Comstock have included them in their works, and there are several valuable books on the subject. Still, spiders are less popular than butterflies or beetles, and Mr. Emerton has brought out the work before us, illustrated with no less than 501 illustrations in the text, in which he has given a very useful account of the commoner American spiders, classed under ten families. Mr. Emerton informs us that there are at least 300 or 400 species of spiders to be found in the neighbourhood of any city in the United States. The introductory matter is very good, dealing with structure, habits, collecting, &c., and the diagrams on p. ix, showing the undersurface of a spider and the front of the head, are particularly clear. So many families, genera, and occasionally even species of spiders are common to the United States and Europe that a student beginning to collect British spiders could not do better than use this book in conjunction with Miss Staveley's "British Spiders," before passing on to the more elaborate works of Blackwall and Pickard Cambridge.

Trees in Prose and Poetry. Compiled by Gertrude L. Stone and M. Grace Fickett, Instructors in State Normal School, Gorham, Maine. Pp. xi + 184; illustrated. (Boston, U.S.A., and London: Ginn and Company, 1902.) Price 2s.

THERE are many methods of nature-study in America, and in some more attention is given to the æsthetic and emotional sides of education than to the scientific. This little book is a collection of extracts from good writers showing that trees have often been the source of literary inspiration. It is good that children should become familiar with the best literature their country provides, and when at the same time they have their attention directed to the study of nature, the lesson becomes of increased value.

Chart of the Metric System. Constructed by Prof. C. Bopp. With a pamphlet of "Notes." Pp. 15. (London: Williams and Norgate.)

THIS diagram of the metric units of length, area and volume is printed on a sheet of paper about 3 feet 6 inches by 2 feet 6 inches. The various measures are shown full size. To be of the greatest use in class teaching, the chart should be used in conjunction with models, and fortunately these are to be obtained. With the aid of the "Notes," teachers should have no difficulty in making the idea of the decimal system easy of comprehension to their pupils.

NO. 1721, VOL. 66]

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Vortex Spirals.

IT appears that a reference to Dr. W. M. Hicks's memoir on the properties of spiral fluid vortices (*Phil. Trans.*, 1898), inserted in the recent reprint of FitzGerald's Helmholtz lecture of January, 1896 ("Collected Scientific Writings," p. 353), has suggested the misconception that the idea of spiral vortices originated with FitzGerald and was subsequently developed by Hicks.

It is beyond doubt, from the context, that FitzGerald derived his knowledge of the possible existence and the properties of vortex spirals from the detailed discussion of vortex theories of matter and their difficulties, contained in Dr. Hicks's presidential address to Section A of the British Association in September, 1895; in this address, and in papers communicated to Section A, that striking extension of vortex theory was explained in illustration of the structure of optically rotational atoms. This is the more certain as Dr. Hicks's observations (*loc. cit.*) as to the possibility of the mutual absorption of a pair of Hill's spherical vortices (M. J. M. Hill, *Phil. Trans.*, 1894) were mentioned by FitzGerald in the same context. J. LARMOR.

October 13.

Bipedal Locomotion in Lizards.

THE accounts of bipedal locomotion among lizards contributed by Mr. E. A. Green and Miss R. Haig Thomas are of high interest. This peculiar method of progression has been recorded by me of the Australian lizards *Physignathus lescuri* and *Amphibolurus muricatus*, in addition to the frilled species *Chlamydosaurus Kingi*, all belonging to the Agamidae. More recently I have found by experiment that a member of the American greaved lizards, *Tupinambis nigropunctatus*, possesses a like bipedal habit, and have been informed by a correspondent, Mr. H. Preston, that the same locomotive peculiarity is commonly manifested by the allied form *Amiaeva Surinamensis* and also by sundry species of the typical iguanas. Another correspondent has informed me that that singular iguanoid the basilisk is likewise bipedal, not only on *terra firma*, but that it will also run rapidly over the surface of water in an erect position. As is the case with the long-toed aquatic birds the jacanas, the feet of the running lizard are most probably in this case supported in transit by a more or less substantial substratum of water plants.

The bipedal progression attributed to *Lacerta viridis* and an allied form is, as compared with that of the above-named species, relatively incomplete; the tail is not raised clear from the ground during locomotion, and neither is the erect attitude sustained for any duration of time. The conspicuously greater length of the hind limbs that characterises all those species of which sustained bipedal locomotion has been recorded is a prominent feature in many other types which will probably be found to possess the same habit. Among these, members of the agamoid genera *Gonioccephalus*, *Otocryptis*, *Japalura* and *Calotes*¹; some of the Anolids, *Uraniscodon* and others among the Iguanidae, and *Cnemidophorus* belonging to the Teiidae, may be indicated as likely to yield affirmative evidence in this direction. W. SAVILLE-KENT.

Milford-on-Sea, October 9.

Theories of Heredity.

IS there not room for some provisional hypothesis which shall include both Galton's and Mendel's ideas, which are not necessarily antagonistic, but may turn out to be as simultaneously true as the laws of Boyle and Charles, so that the final results may be of the nature of a product or resultant? I mean that instead of drawing a hard-and-fast line between "recessive" and "dominant" characters we may suppose that these differ like heat and cold, in degree but not in kind. So that "dominance" may be measured on some scale from 0 upwards, the measure of dominance being perhaps a function of the number of generations for which a character has been established.

¹ Since writing this letter, a confirmation of my anticipation in the case of this genus has been recorded in NATURE for October 9 by Mr. N. Annandale.—W. S.-K.